TALKING POINTS FOR MR. DANIEL GOLDIN

FOR NORTH CAROLINA C OF C
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"As certainly as there are pressing needs of the day, the needs of the future surely will be far more desperate if we do not prepare for them today. To prosper, our children and grandchildren will need new jobs in new technologies, new challenges and new worlds to conquer. We have no mechanism which transmits this legacy more effectively than our space program." (James Michener)

NASA represents America's investment in the future -- our belief that tomorrow will be better than today.

Much as the technology of the Apollo program and prior space science missions and aeronautics research has revolutionized our way of life in the twentieth century, Space Station Freedom and the missions of tomorrow that are being planned today in NASA will revolutionize our way of life in the twenty-first century.

Look around you -- there is hardly an area of your life where space technology does not work for you to improve your quality of life.

Whether you are in the home, the office, the classroom or the hospital -- spinoffs from the civil space program are at work for you:

Weather forecasting
Telecommunications
Advanced Composites and Materials
CAT Scans / Pacemakers / Non-Intrusive
Medical Procedures
High Performance Computers
Credit Card Machines

Six months ago, when I got the call to be the new Administrator of NASA, I accepted the challenge because I thought it was important for this Nation to place greater emphasis on its long term R&D investment strategy and because I wanted to put NASA on a more businesslike footing -- let me briefly address both of these items with you.

Today our country faces an economic challenge unparalled in our history. Markets are global. Competitors are numerous, and very good at what they do. Only world-class products will suffice.

To manage this study of our environment, we need a host of technological advances. Detectors, data storage and processing, computer modelling techniques to name a few.

In addition to our research efforts, we see almost endless commercial opportunities developing out of this area of government endeavor. We envision industry developing satellites to sell data about the Earth, developing new business to use the raw data we collect, manipulating it to add value for use by yet other companies -- to make maps, to understand agricultural conditions, to do city planning and resource surveys, and we see aerospace and non-aerospace companies benefitting from our advances in information storage and handling.

NASA's second thrust relates to space science and understanding the Universe around us. Just as we use spacecraft to look downward upon the Earth, so also do we use them to look outward. We peer out at the stars, examine distance galaxies, and look to the edge of the Universe.

Hubble Space Telescope's nickel-hydrogen battery design is the most advanced, long-life, rechargeable battery technology developed over the past 50 years; this technology might be used by industry -- perhaps in environmentally sound, energy efficient electric vehicles of the future.

Scientific spacecraft require state-of-the-art lightweight structures and materials, advanced thermal control systems, resistant coatings, and precision stabilization and pointing systems. NASA and its aerospace industry teams stay at the leading edge of these technologies and we want to make sure that they are used by all of industry for diverse purposes. The space program does not achieve its full potential if these technologies are not used by industry for purposes outside space exploration.

In this century, our space science spacecraft have visited every planet except Pluto -- and we are working to correct that with a new low-cost mission.

Today, as we sit here, Magellan is at Venus and Galileo is on its way to Jupiter. Later this month, we will send Mars Observer to the Red Planet Mars, and Cassini will head off to Saturn later in the decade.

These spacecraft will require the most advanced technologies we can develop. They will require systems that are lightweight, small, durable and highly integrated. They will employ neural network and other expert system technologies that will monitor, diagnose, and correct spacecraft operational problems at a distance. We want to see these technological capabilities adding value to products and manufacturing processed here on Earth.

The third thrust of NASA's programs -- the human exploration of space -- will require the very best from this nation's scientists and engineers.

Our country is not secure if our industries cannot compete. Our people are not safe if jobs and customers are lost to companies overseas. Industrial competitiveness is a critical component of our national security -- as critical as an effective national defense.

We have no greater obligation today than to pass on to our children, our children's children and their children a country that is economically sound, militarily secure and environmentally safe. Technology is critical to all three of these goals.

Until I became the NASA Administrator, I was a businessman. I understand the problems you confront daily. I understand the importance of the bottom line.

NASA develops technology for our mission activities and to enhance our competitive posture in space and aeronautics. And I believe that we have an absolute obligation to make that technology available to US industry, so that you can enhance the quality and competitiveness of your products.

We call the last 30-odd years the "Space Age," and that is synonymous with technical innovation and mind-boggling technologies. The US space program has not been an expenditure; it has been -- and continues to be -- an investment, an investment in science and technology, an investment in America's future.

Technology is at the core of almost everything NASA does. It permeates our work. We cannot map the surface of Venus, flight test the X-29 experimental airplane, or launch the Space Shuttle without depending on advanced technology.

At NASA, we do many different things. But there are five major thrusts that constitute the core of our R&D activities:

- **We seek to understand planet Earth;**
- **We seek to understand the Universe around us;**
- **We seek to expand human presence into the solar system;**
- **We conduct basic aeronautics research; and**
- **We provide a world-class infrastructure to support these activities.**

Planet Earth is the focus of our first thrust.

We know Earth is a complex integrated ecosystem. We know it is both fragile and resilient. NASA's Mission to Planet Earth is an immense undertaking with the objective of gathering scientific data to determine what is happening and how and why.

If corrective actions with potentially massive economic impacts are necessary, policy makers cannot make such momentous decisions on a hunch.

When the Space Shuttle lifts off from the Kennedy Space Center as it did last Saturday, it carries more than scientific payloads, it carries human brains and hands that can analyze problems and implement solutions in real time. It permits research that will allow us to develop the technologies and countermeasures to explore the solar system and to improve the quality of life on Earth.

Just recently, NASA concluded an agreement with the NIH that is intended to stimulate new opportunities in biomedical and behavioral research. This research should help NASA better understand how neurovestibular (sensory/balance) and musculoskeletal (bone/muscle/tissue) systems function in space and hopefully will lead to new treatments for diseases or dysfunctions for patients here on Earth.

We are now building Space Station Freedom. The Space Station will be a laboratory in space for research and technology development. We will use it to understand how to live and work in space over extended periods.

This work is critically important because it will enable us to return to the Moon, this time to stay, and later to embark upon a human mission to Mars, a mission that the President has called "a journey to tomorrow."

The technology requirements for this program are immense. We need advances in launch vehicle systems, propulsion and cryogenic fluid handling systems. We need to develop countermeasures to protect against the effects of cosmic radiation and microgravity. We need to develop regenerative life support systems, microminiature diagnostic devices to allow remote medical care. We will need nuclear-generated electrical power, and quantum leaps forward in telerobotics, materials and structures.

At the same time, these developments will enable us to explore the solar system; they also will be available for applications for people and for industry here on Earth.

NASA's fourth thrust is aeronautics.

Here we concentrate on aerodynamics, propulsion, materials, human factors, and high-performance computing among others.

Our goal is to conduct basic research in pre-competitive technologies so that US industry can maintain preeminence in civil and military aircraft.

The US aerospace industry is our largest exporter of manufactured goods. This export sector, comprised predominantly of airplanes, engines and parts, realizes a net positive balance of trade on the order of $30B annually. The US trade deficit -- which runs about $60B in the red each year -- would be half again as large were it not for the positive contribution of the aerospace industry. And our competitiveness

in this sector is due in no small part to the basic research conducted by NASA and transferred to industry over the years.

To remain competitive, US aircraft must be cheaper to build and operate and must be more respectful of our environment. Across the full range of flight regimes -- subsonic through supersonic through hypersonic -- we're working to make airplanes safer, lighter, quieter, less polluting and more fuel efficient.

Closely connected to all of our work at NASA is the fifth and final thrust of what we do -- we maintain a world-class infrastructure of research and test facilities serving both astronautics and aeronautics.

We have launch facilities, wind tunnels and acoustic test chambers to name a few. A key element of this infrastructure is our supercomputer capability. We work with industry to push the state-of-the-art both in high speed processing and in massively parallel processing. For our Mission to Planet Earth activities alone, we will require on the order of a dozen supercomputers to handle a terrabit of data per day -- each day, as much information as fills the Encyclopedia Britannica.

We are going to maintain NASA's infrastructure, improve it and expand its use by the private sector.

Indeed, across all of NASA's activities, I am committed to broadening the level of cooperation between NASA and industry. We want to be innovative and flexible. We want to be effective at transferring technology. We want to support this great Nation in every way that we can.

As for my second area of focus this morning -- putting NASA on a more businesslike footing -- I would like you to know that a revolution is starting to take place in NASA and people throughout the Agency and our industry team are looking for new ways to conduct business -- new ways to develop spacecraft and systems that are cheaper, faster and quicker.

NASA used to develop spacecraft in years, now it takes decades. That is not acceptable and a series of Red and Blue teams have been created to reassess what we have on the drawing boards, and how we intend to do it. Already, these teams have come up with some excellent recommendations that have allowed the Agency to redesign some of its major programs and to substantially reduce our outyear budgets. Yes, NASA is well aware of the budget situation and we are doing everything possible to bear our fair share of the deficit reduction effort -- while not doing any damage to implementation of a balanced civil space program.

We also are working within NASA to incorporate Total Quality Management (TQM) principles into everything we do. Process action teams are being established throughout the Agency and every senior manager in the Agency has his or her own personal metrics to measure their performance. We are trying to empower our

workforce and to put the decision-making authority back into the hands of the workers – not just the managers.

I saw the value of this transformation at my former company, and I am convinced that this initiative will reap rewards for NASA.

Another key element of the change that we are bringing about at NASA is a greater emphasis on cultural diversity. During the last few months, we have placed great emphasis on enhancing the cultural diversity of the NASA senior management and now we are starting to campaign to make that a critical element of our workforce. NASA is there for the American people and it must offer hope and opportunity for all Americans.

Let me say that it is an honor for me to appear before such a distinguished group to tell you what NASA is doing to pave the way for sustained US economic and technological leadership in the twenty-first century. I believe that NASA is a critical element of our Nation's investment portfolio, and I am committed to giving you, our shareholders, the maximum return on your investment. I also am committed to making sure that NASA technology continues to work for you and the American people.

Concerning this point, let me give you one bit of data. A recent survey of 259 NASA spinoffs developed in the 1979-86 timeframe indicated that these technologies had generated over 350,000 new jobs – and $21 billion in sales or savings. The next time somebody asks you why do we invest in the space program, you now have an answer.

In conclusion, I would like you to look to the future. Imagine that sometime, hopefully early in the next century, an airplane will take off from San Francisco and streak across the Pacific in three and one-half hours.

At about the same time, a young child will enter a classroom and sit down at a computer where she will employ virtual reality to better understand elementary biology.

And, also before too many years pass, two explorers will set off on foot to search for signs of subsurface water in a valley not far from their base camp on Mars.

I want that airplane to be built in America.

I want that child to be an American.

I want those two explorers to hail from the United States.

Technology, the courage to reach far into the future, and the support of the American people will make it so. NASA can turn your dreams into realities – and I am pleased to have the honor of leading the NASA team.

Thank you.